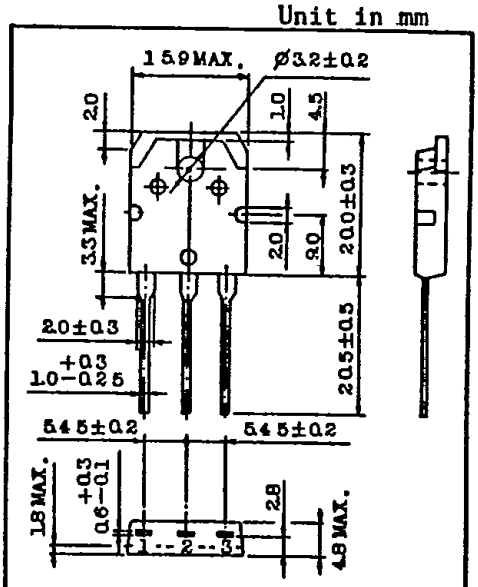
TOSHIBA SEMICONDUCTOR
TECHNICAL DATA

TOSHIBA FIELD EFFECT TRANSISTOR
S 2 3 7 0
SILICON N CHANNEL MOS TYPE
(π-MOSⅡ)

INDUSTRIAL APPLICATIONS

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS.
CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR
DRIVE APPLICATIONS.

Unit in mm



1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

JEDEC	—
EIAJ	—
TOSHIBA	2-16C1B

Weight : 4.6g

FEATURES:

- Low Drain-Source ON Resistance : $R_{DS(ON)}$=0.030Ω(Typ.)
- High Forward Transfer Admittance : $|Y_{fs}|$=13S (Typ.)
- Low Leakage Current : I_{GSS}=±100nA(Max.) @ V_{GS}=±20V
  I_{DSS}=300uA (Max.) @ V_{DS}=60V
- Enhancement-Mode : V_{th}=1.5~3.5V @ V_{DS}=10V, I_D=1mA

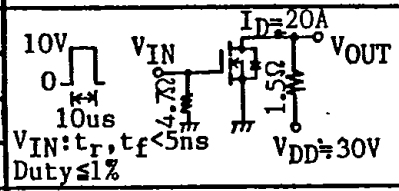
MAXIMUM RATINGS (Ta=25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSX}	60	V
Drain-Gate Voltage (R_{GS}=20kΩ)		V_{DGR}	60	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	DC	I_D	40	A
	Pulse	I_{DP}	160	
Drain Power Dissipation (Tc=25°C)		P_D	125	W
Channel Temperature		Tch	150	°C
Storage Temperature Range		T_{stg}	-55~150	°C

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	1.00	°C/W
Thermal Resistance, Junction to Ambient	$R_{th(j-a)}$	50	°C/W
Muximum Lead Temperature for Soldering Purposes (1.6mm from case for 10 seconds)	T_L	300	°C

ELECTRICAL CHARACTERISTICS (Ta=25°C)

CARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Drain Cut-off Current		I_{DSS}	V_{DS}=60V , V_{GS}=0V	-	-	300	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	I_D=10mA , V_{GS}=0V	60	-	-	V
Gate Threshold Voltage		V_{th}	V_{DS}=10V, I_D=1mA	1.5	-	3.5	V
Forward Transfer Admittance		$\|Y_{fs}\|$	V_{DS}=10V, I_D=20A	9.0	13	-	S
Drain-Source ON Resistance		$R_{DS(ON)}$	I_D=20A , V_{GS}=10V	-	0.030	0.045	Ω
Input Capacitance		C_{iss}	V_{DS}=10V, V_{GS}=0V, f=1MHz	-	2100	2700	pF
Reverse Transfer Capacitance		C_{rss}		-		1000	
Output Capacitance		C_{oss}		-	2000	2800	
Swiching Time	Rise Time	t_r		-	45		ns
	Turn-on Time	t_{on}		-	65		
	Fall Time	t_f		-	25		
	Turn-off Time	t_{off}		-	80		
Total Gate charge (Gate-Source Plus Gate-Drain)		Q_g	I_D=40A , V_{GS}=10V V_{DD}≒48V	-	65		nC
Gate-Source Charge		Q_{gs}		-	35	-	
Gate-Drain ("Miller") Charge		Q_{gd}		-	30	-	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta=25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	--	-	-	40	A
Rulse Drain Reverse Current	I_{DRP}	--	-	-	160	A
Diode Foward Voltage	V_{DSF}	I_{DR}=40A ,V_{GS}=0V	-	-	1.8	V
Reverse Recovery Time	t_{rr}	I_{DR}=40A dI_{DR}/dt=50A/us	-	150	-	ns
Reverse Recovered Charge	Q_{rr}		-	0.35	-	μC